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The Files - New Equipment File

13 March 1959

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Trip Report - [redacted]

1. On 26 February 1959 a visit was made to the Decker Aviation Corporation, 1361 Frankford Avenue, Philadelphia, Pennsylvania, to investigate the development by Decker of a light modulation communications system. Participating in discussions concerning this program were:

Mr. Neil B. Harding - Sales Manager (Col. USAF, Ret.)
Mr. Lazarus Thomaides - Assistant Director, R+D Division
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2. This visit was made as the result of recent publicity given to a Decker light modulation communications system. (Air Force magazine, January 1959, page 88) Mr. Harding explained that the development was still in the prototype stage and that his company was attempting to interest government agencies in its application. He said that several demonstration systems using visible light had been constructed and a transistorized version was now being assembled at the Roth Laboratories in Hartford, Connecticut. Dr. Roth, the Director of the Laboratories, is a Decker consultant. In addition to communications, the light modulation technique has application as a proximity warning indicator, according to Mr. Harding, and a prototype PWI is now undergoing tests at Wright Field.

3. A demonstration was made of this system by transmitting voice and tone signals across a 50-foot laboratory. The fidelity is excellent but the level of background noise casts some doubt on the company's claim that the system is good over a 5-mile range. Mr. Thomaides explained that visible light is used because components were readily available, and added that the system is fully applicable to infrared or ultraviolet, although the latter had little to recommend it, in his opinion. The range with infrared was claimed to be equal to or better than that using visible light.

4. There appears to be two unique features in this system of light modulation. The first is a novel technique for amplitude modulating the light signal electrically by means of a segmented glass block and polarizing filters. Audio modulation is impressed on a high frequency polarizing signal which in turn modulates the transmitted light beam by varying the voltage impressed across the glass block at about a 1 mc rate. Since the modulation technique is fully

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electrical, high fidelity audio signals may be successfully transmitted, and the company claims a modulating range of at least 8 kc. The second unusual feature is the receiver which is simply a photomultiplier tube feeding an audio amplifier. Polarization filters and a collecting lens demodulate the incoming light beam. The transistorized version of the complete receiver, including batteries for 20 hours operation, measures 2 x 8 x 4 inches, according to Mr. Harding.

5. The transistor version of the transmitter is said to measure only 9 x 9 x 4 inches. It will contain a 50 or 100-watt bulb and modulating circuits to deliver about 10 watts of power to the glass block. In response to the writer's questions, Mr. Thomaides said that the 100-watt bulb could be eliminated from the 5-mile system with the use of a chemical light source. A small vial of sodium, he said, would burn for several hours in a Bunsen-type burner and its radiation would be concentrated in the sodium spectral lines. With suitable infrared filters a signal in the 8000 to 9000 angstrom range could be transmitted and received at the other end by means of an IR photomultiplier. The beamwidth of the system is adjustable.

6. Mr. Harding said that negotiations were progressing for a CONFIDENTIAL project with BuShips. He also said that the Federal Aeronautics Administration was observing the FWI tests in Dayton. He said his company would be happy to submit an unsolicited proposal if they had a general idea of our requirements. Since there are no cleared people at Decker, this discussion was held on an UNCLASSIFIED basis and [redacted]

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Attachment:
Reprint of "Control Engineering" (July 1957),
Feature on Decker System

Distribution:
R+D Subject File
Monthly Report
R+D Lab
OC-O
OC-T/CT-OR
TSS/AFD- [redacted] 25X1A9a
Project 2070
EP Chrono

OC-E/R+D-EP/WJB:brc (13 March 1959)

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